Supplementary information (ESI)

Rutile TiO_2 nanowire arrays interconnected with ZnO nanosheets for high performance electrochemical UV sensors

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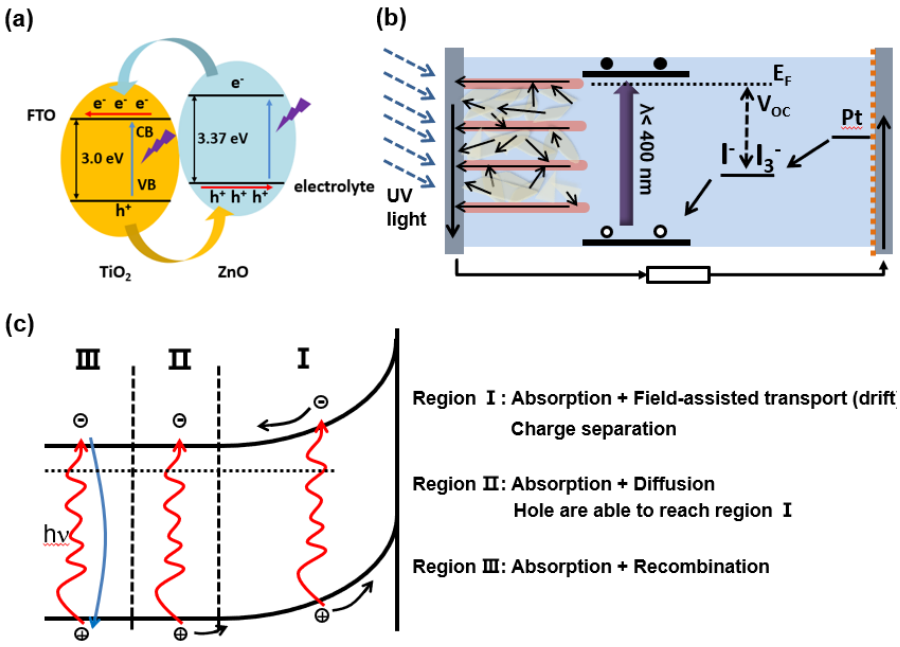

Fig. S1 (a) Schematic description of the energy band alignment of the TiO_2/ZnO heteronanostructure. (b) Energetics operation of photoelectrochemical-type UV sensor using TiO_2/ZnO heteronanostructure as photoanode. (c) Absorption regions in a semiconducting photoanode.[1]

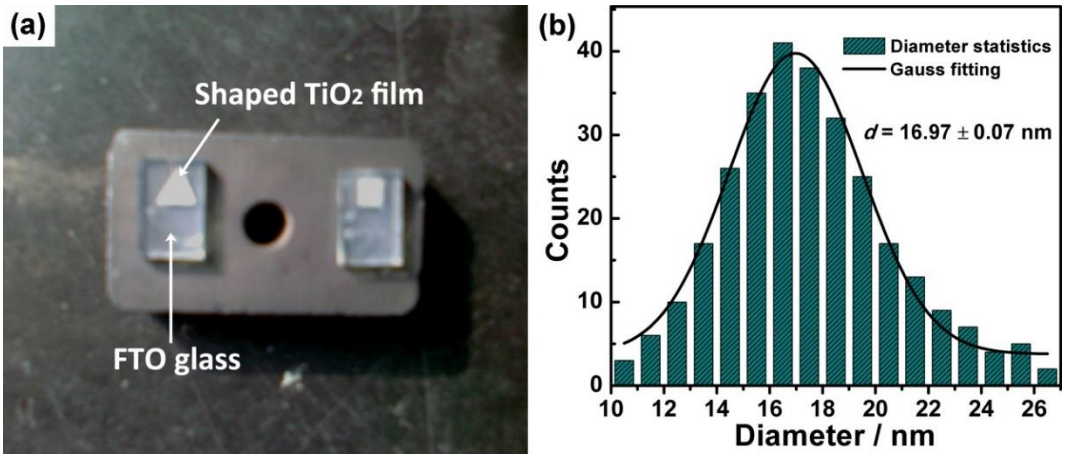

Fig. S2 (a) Optical photograph of the shaped TiO_2 nanowire films prepared through hydrothermal method and (b) diameter statistics of the TiO_2 nanowires.

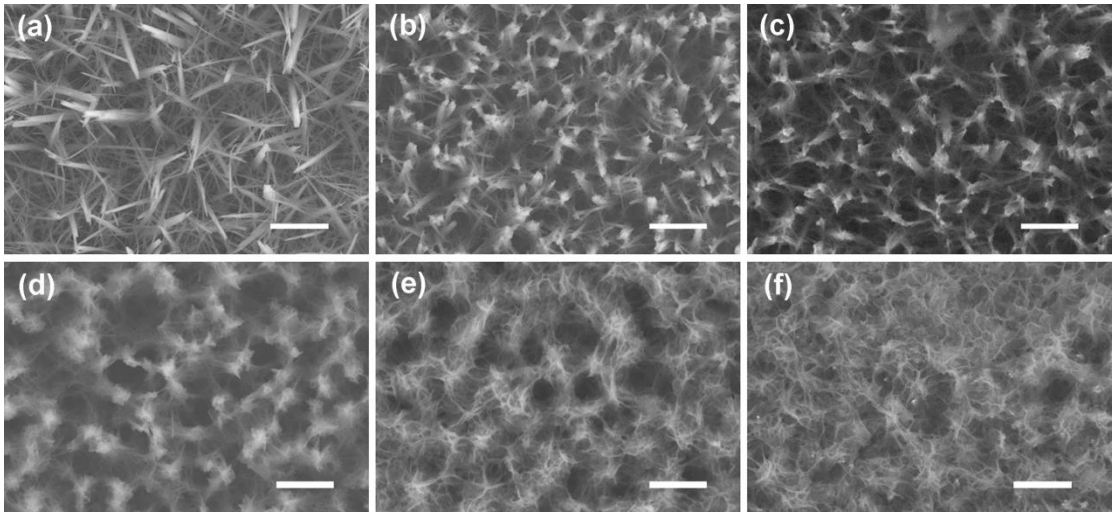

Fig. S3 Top-view SEM image of (a) TiO_2 nanowires and serial TiO_2/ZnO hierarchical nanostructures prepared at various hydrothermal reaction time: (b) 1h, (c) 2h, (d) 4h, (e) 6h and (f) 8h. All the scale bars are 1 μm.

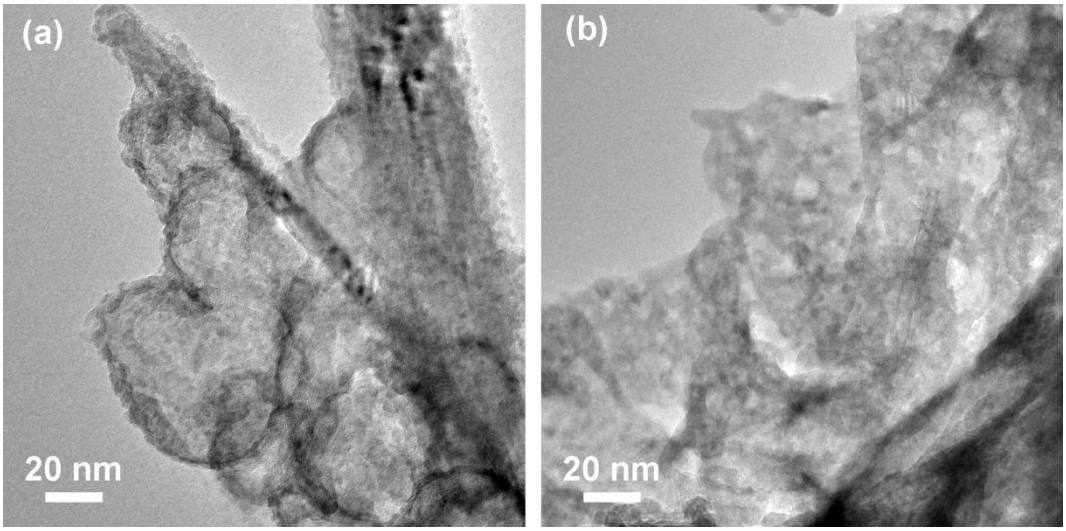

Fig. S4 TEM images of the discrete TiO_2/ZnO heterostructure.

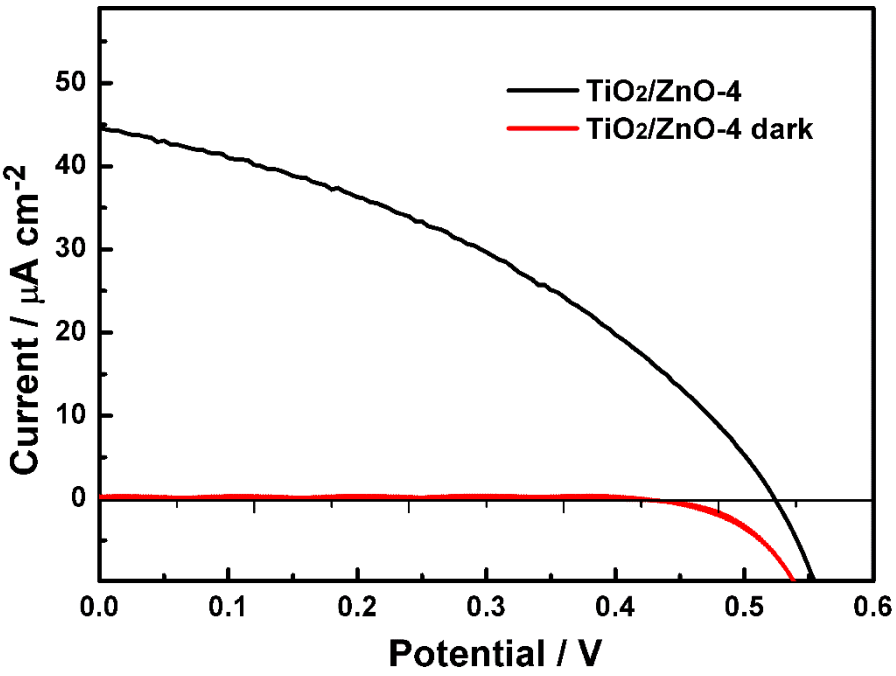

Fig. S5 *J-V* curves of TiO_2/ZnO-4 with/without UV irradiation.

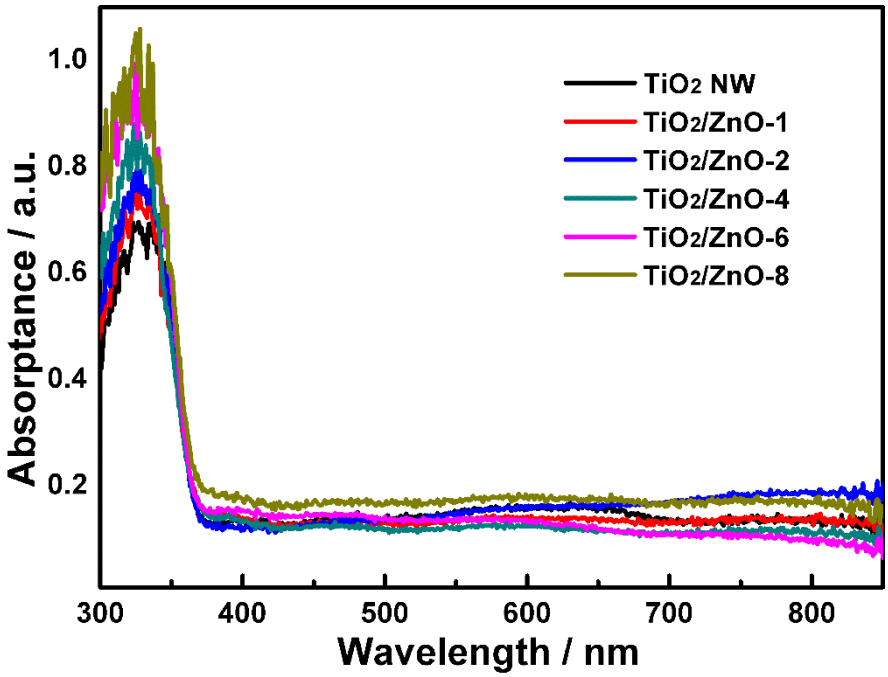

Fig. S6 The absorption behavior of the TiO_2/ZnO films in the wavelength range from 300 nm to 850 nm.

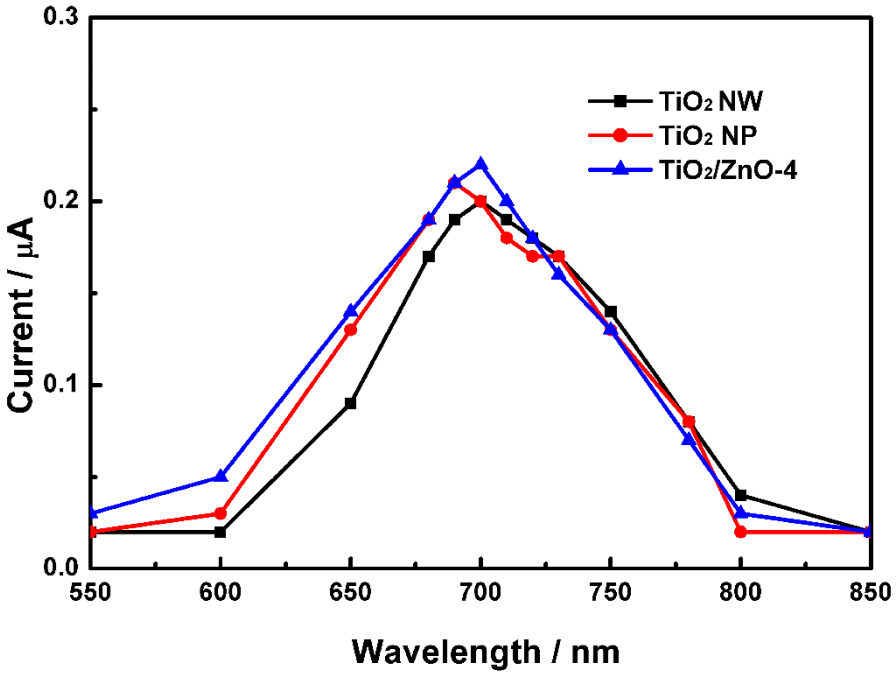

Fig. S7 Spectral responses of J_{sc} signals in visible range.

[1] R. van de Krol, Principles of Photoelectrochemical Cells, in: R. van de Krol, M. Grätzel (Eds.) Photoelectrochemical Hydrogen Production, Springer US, 2012, pp. 13-67.